GAMATRONIC ELECTRONIC INDUSTRIES LTD

G-NET 1 KVA / 2 KVA / 3 KVA

ONLINE UNINTERRUPTIBLE POWER SYSTEM

USER MANUAL

2 / 3 KVA MODEL

1 kVA MODEL

Release 1.0

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RECYCLING INFORMATION

Consult your local recycling or hazardous waste center for information on proper disposal of a used battery or UPS .

WARNING

Do not dispose of batteries in a fire Batteries may explode. Consult with your local recycling/ hazardous waste center for disposal requirements.

CAUTION

Do not discard the UPS or its batteries in the trash This product contains sealed lead-acid batteries . For proper disposal, contact your local recycling / hazardous waste center.

CAUTION

Do not discard waste electrical or electronic equipment(WEEE) in the trash. For proper disposal, contact your local recycling/ hazardous waste center.

1. System description

The G-NET series of Uninterruptible Power Supplies (UPS) is a line of advanced, true on-line UPSs which provide clean, reliable, and regulated AC power to your precision equipment. The G-NET-series UPS is suitable as a power supply for loads such as computers, telecommunication equipment, and computerized tools.

As a true on-line UPS, the G-NET-series UPS continuously provides conditioned power to attached devices. Under normal power conditions the UPS is constantly regulating and filtering out any fluctuations of the input voltage.

In the event of an electrical power failure, the UPS employs its internal batteries to supply back-up power to the attached devices with no interruption.

During an overload or inverter failure condition, the UPS automatically transfers the load devices to the bypass line, again without interrupting the supply of power to the load devices. When the overload condition is cleared, the UPS automatically transfers the load back to the inverter.

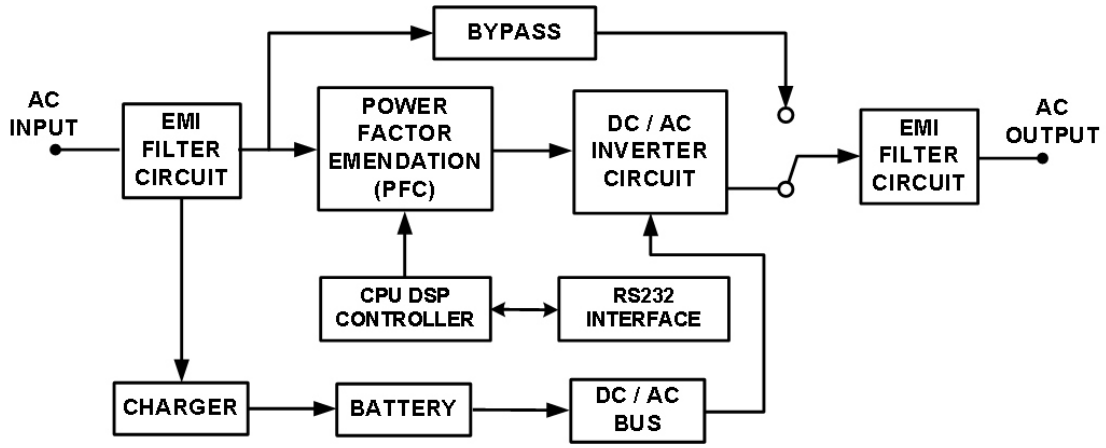

Figure 1: Block diagram of system architecture

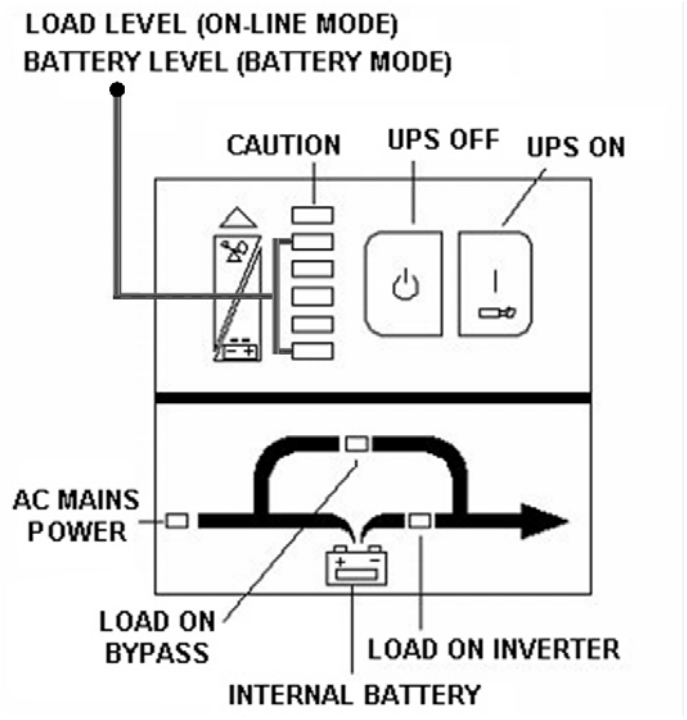

Figure 2: The UPS control panel

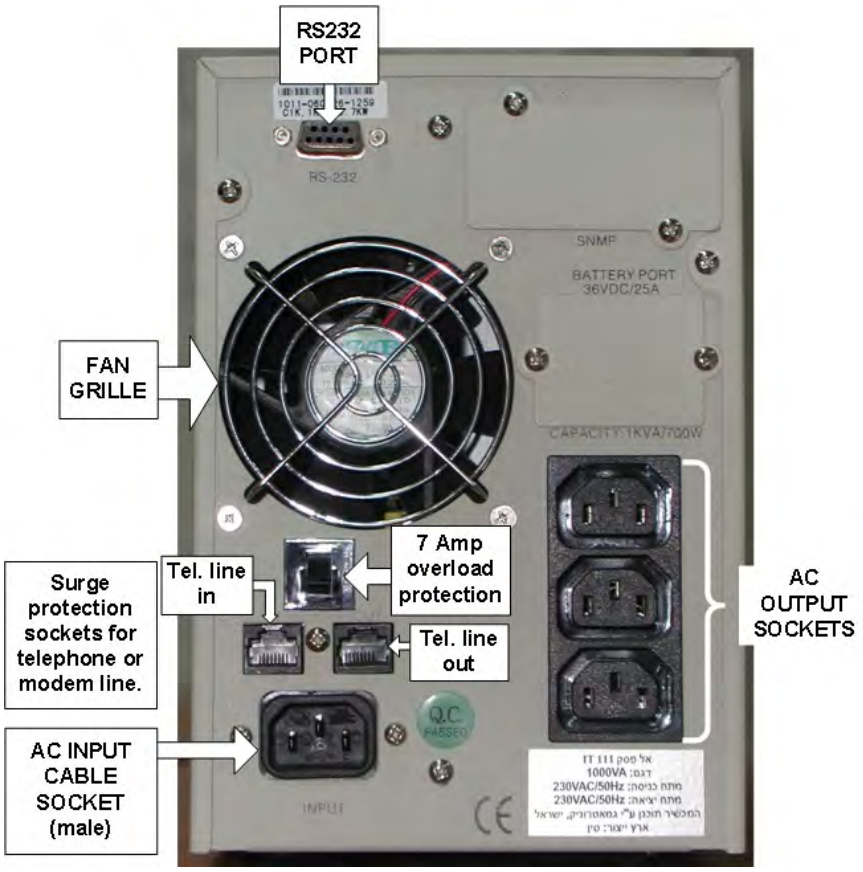

Figure 3: G-NET 1 kVA rear panel

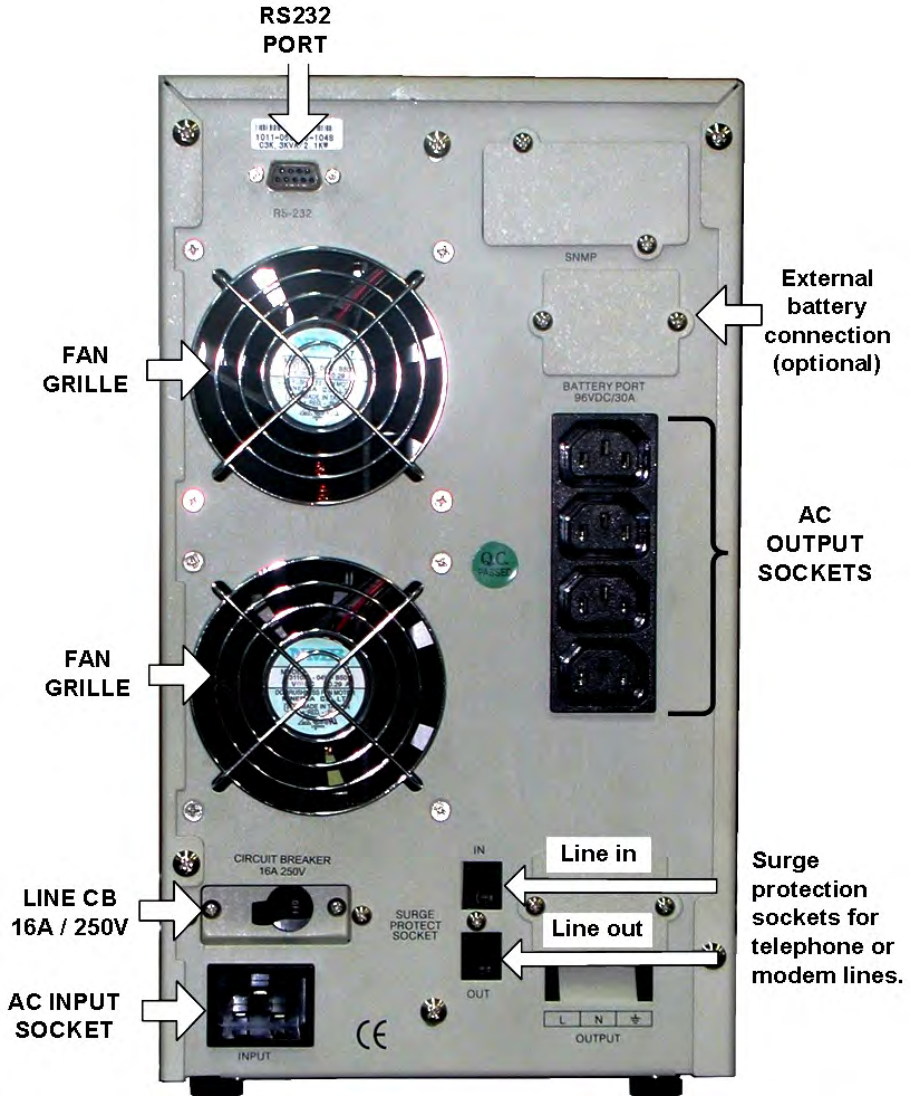

Figure 4: G-NET 2 kVA rear panel

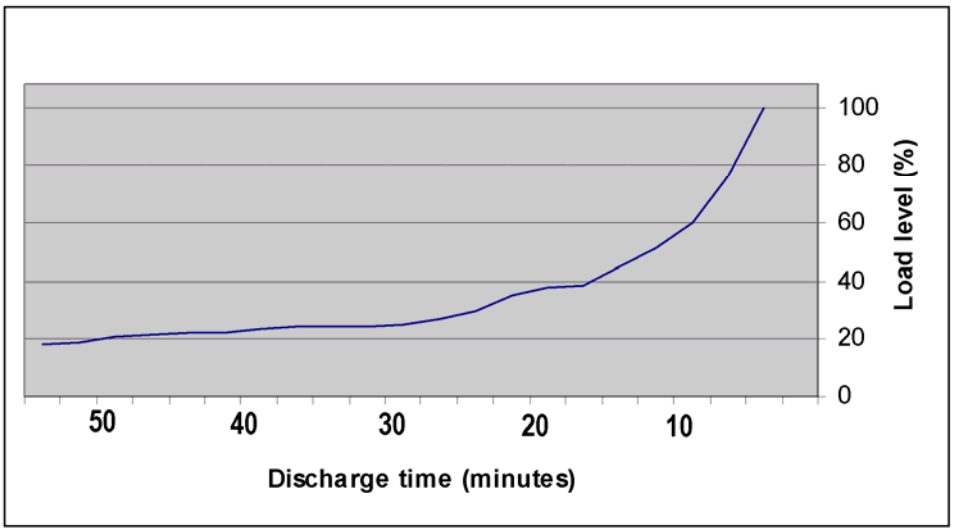

Figure 5: Backup time vs. load, representative

2. When you receive your UPS

The G-NET UPS is delivered in a box to protect the UPS from damage. Before you open the box, inspect the box to verify it is undamaged. If you note any damage to the box, immediately notify the delivery firm.

Save the UPS carton; you may need it later.

Perform a visual inspection of the UPS. Notify your dealer immediately if you detect any signs of damage to the UPS.

The UPS carton contains the following items:

- The G-NET UPS.
- The User Guide (this book).
- Compact disc with software for automatic computer shutdown.
- Communication cable.
- Cable for connecting the UPS with the ac mains input.

3. Installing the UPS

1. Verify that the voltage and frequency of the ac power mains is appropriate for the UPS (160 ~ 300 Vac, 50 Hz).
2. Use the supplied cable to connect the UPS to the ac power mains. The connection on the UPS for this cable is located on the rear panel and is labeled AC INPUT in Figure 3 (on page 2) and Figure 4 (on page 3).

Important notice: The UPS is delivered with the batteries uncharged. The batteries are not able to provide backup until they have been charged. To charge the UPS batteries, leave the UPS connected to the ac mains and with no load devices attached to the UPS, for at least 8 hours.

It is permissible to use the UPS before the 8 hours of charging is complete. Just be aware that if you do, the backup voltage (in the event of a power failure) will be shorter than normal until the battery charging process has completed.

3. Turn on the UPS by pressing the “ON” button on the front panel (see Figure 2 on page 2). Wait about 10 seconds until the “LINE” LED on the UPS front panel remains steadily lit.
4. Connect the computer or other load devices to the UPS rear panel, using the sockets labeled “AC OUTPUT” in Figure 3 or Figure 4.

4. Operating instructions

4.1 TURNING ON THE UPS

To turn the UPS on, press the “ON” button on the UPS front panel (see Figure 2 on page 2). The ON button is labeled “**|**”. Wait about ten seconds until the “LINE” LED on the UPS front panel remains steadily lit.

4.2 TURNING OFF THE UPS

To turn the UPS off, press the “OFF” button on the UPS front panel (see Figure 2 on page 2). The “OFF” button is labeled like this: .

4.3 PERFORMING A BATTERY TEST

To test the UPS battery, when the UPS and the load devices connected to it are operating, do the following:

1. On the 2 kVA and 3kVA models, locate the rear panel line circuit breaker that is situated on top of the ac line connection and turn it OFF.

   On the 1 kVA model, locate the external circuit breaker that controls the ac mains feed to the UPS and turn it **OFF**.

2. For all models, an audible alarm (beep) will be heard about every four seconds, and the orange LED labeled “BAT” on the front panel lights up. The lighting of the “BAT” LED and the audible alarm indicate that the battery is supplying power to the load devices.

3. To end the test, turn ON the circuit breaker controlling the ac input to the UPS (the same circuit breaker you turned off in step 1 above).

5. Control panel features

The UPS control panel on the front side of the UPS contains two function buttons and a number of LED indicators.

5.1 FUNCTION BUTTONS

The button labeled "|" turns the UPS **ON**.

The button labeled turns the UPS **OFF**.

5.2 LED INDICATORS

Table 1: LED indicators on the front panel

LED NAME	FUNCTION
LINE	Lights when ac voltage is present at the UPS input.
BYPASS	When lit, indicates that the load is being supplied from the bypass voltage.
INVERTER	When lit, indicates that the UPS is supplying the load from the inverter (normal operation) .
FAULT	Indicates a problem in the UPS's operation.

5.3 BATTERY LEVEL AND LOAD LEVEL INDICATORS

The UPS front panel includes a column of 6 LEDs (see Figure 2 on page 2).

The uppermost of these LEDs is a red "CAUTION" indicator. In normal (inverter) mode, when this CAUTION indicator lights it indicates an overload condition; the load on the UPS should be reduced.

In battery mode, when the "CAUTION" LED lights it means the battery is almost exhausted.

Of the remaining five LEDs, four are green and one is orange. These five LEDs serve as a load indicator when the UPS is in inverter mode, and as a battery charge indicator when the UPS is in battery mode.

5.3.1 LOAD LEVEL INDICATOR

When the UPS is operating in inverter mode – that is, when it is receiving input power from the ac mains – the column of five LEDs (4 green and 1 orange) serves as a load-level indicator.

Table 2 explains how to interpret the LEDs in this situation.

Table 2: The LED column as a load-level indicator

NUMBER OF LEDS LIT	RELATIVE LOAD LEVEL	COMMENT
1	0–30 %	
1 2	31–50 %	
1 2 3	51–70 %	
1 2 3 4	71–95 %	
1 2 3 4 5	96 %+ (overload)	The audible alarm beeps twice per second. Turn off unnecessary load devices.

LEDs 1–4 are green.
LED 5 is orange.

5.4 BATTERY LEVEL INDICATOR

When the UPS is operating in battery mode – that is, there is no ac input to the UPS and it is supplying power to the load from the battery – the audible alarm beeps about once every four seconds and the column of five LEDs (4 green and 1 orange) serves as a battery-level indicator, showing the relative amount of electrical energy remaining in the battery.

Table 3 below explains how to interpret the column of 5 LEDs in such a situation.

Table 3: The LED column as a battery-charge indicator.

NUMBER OF LEDS LIT	RELATIVE LOAD LEVEL	COMMENT
1 2 3 4 5	100 %	Battery is fully charged
1 2 3 4	76–99 %	
1 2 3	51–75 %	
1 2	26–50 %	
1	0–25 %	The battery is almost exhausted. The audible alarm beeps once every four seconds.

LED 1 is orange.
LEDs 2–5 are green.

6. Replacing the UPS batteries

The batteries supplied with your UPS are of optimum quality. Nonetheless, their lifetime is limited. Battery lifetime depends on the number of charge/discharge cycles, average battery load, environmental temperature, and other factors.

To replace the batteries of your UPS, contact your dealer or an authorized service representative.

7. Troubleshooting

Symptom	Possible cause	Possible solution
None of the LEDs on the UPS front panel light up.	The UPS is not properly connected to the ac mains or the voltage or frequency of the ac mains is not in a range acceptable to the UPS.	Verify that the UPS is properly connected to the ac mains and that the voltage and frequency of the ac mains power is appropriate for your UPS.
	The UPS's ac line fuse needs replacement.	Check the UPS's line fuse. If it needs replacement, replace it with a fuse of the same type and rating.
	You did not press the ON button long enough when turning the UPS on.	To turn the UPS on it is necessary to press and hold the ON button for at lease 0.5 seconds.
The LINE LED does not light and the audible alarm is beeping once every four seconds.	The UPS is not properly connected to the ac mains or the voltage or frequency of the ac mains is not in a range acceptable to the UPS.	Verify that the UPS is properly connected to the ac mains and that the ac mains power is appropriate for your UPS model in terms of voltage and frequency.
	The UPS's ac line fuse needs replacement.	Check the UPS's line fuse. If it needs replacement, replace it with a fuse of the same type and rating.
	The external circuit breaker for the ac line is in the OFF position.	Turn the external circuit breaker on the UPSs ac supply line ON.
The red CAUTION LED is lit and the audible alarm beeps continuously.	The battery is overloaded, or the battery charge is insufficient for the load.	Turn off unneeded load devices to reduce the load on the battery. Charge the battery. Contact your dealer or an authorized service technician. The batteries may need replacement.
The backup time provided by the UPS is shorter than expected.	The batteries need charging. The batteries are defective or need replacement. The UPSs battery charger is defective.	Charge the batteries by leaving the UPS connected to the ac mains with no load for 8 hours. Then perform a battery test as described in section 4.3 on page 5. If the backup time is still too short, contact your dealer or an authorized service technician.

Symptom	Possible cause	Possible solution
All of the load-level LEDs are lit and the audible alarm is beeping twice per second.	The UPS is overloaded.	Reduce the load on the UPS by turning off some of the load devices.
The UPS operates normally, but the "BAT" LED flashes and the audible alarm beeps steadily.	Battery voltage is low. Battery voltage is higher than the charging voltage.	Charge the batteries by leaving the UPS connected to the ac mains with no load for 8 hours. If this does not eliminate the symptoms, contact your dealer or an authorized service technician.
There is not output voltage and the audible alarm beeps steadily.	The load is short-circuited.	Check all of the load devices for short-circuit.
The UPS is not working, the "LINE" LED flashes, and the audible alarm sounds steadily.	The ac input voltage is too high or two low.	Connect a transformer between the UPS and the ac mains.
The "LINE" LED flashes continuously.	The Phase and Neutral input wires are reversed.	Reverse the ac input Phase and Neutral connections.
The "BAT" and LINE" LEDs are lit.	The voltage and/or frequency of the ac input are out of range.	Connect a transformer between the UPS and the ac mains.
The "BAT" LED is lit and the audible alarm beeps twice per second.	The battery is almost completely discharged.	Turn off the UPS before the battery becomes completely discharged.

8. Automated computer shutdown

A compact disk (CD ROM) is delivered along with the UPS. The disk contains software that can be installed on a computer. If that computer is connected to the UPS, then, the software can be used to perform an automatic, orderly shutdown of the computer in the event of an ac power outage.

1. Connect one end of the supplied D9 – D9 cable to the rear panel of the UPS, and connect the other end to the computer. The D9 socket is shaped like this: .
2. Insert the supplied compact disk into the computer. The installation program on the disk begins execution automatically. Follow the instructions on the computer screen to complete the installation of the software.
3. Simulate an ac power failure and verify that the software automatically shuts down the computer after the specified time interval.

If technical support is required, this can be obtained by contacting your dealer or authorized service representative.

The diagram below shows the pin usage for the RS232-D9 socket.

Table 4: Pin usage on RS232-D9 socket

Pin #	Function	I / O
2	RS232 Rx	Input
3	RS232 Tx	Output
5	Ground	

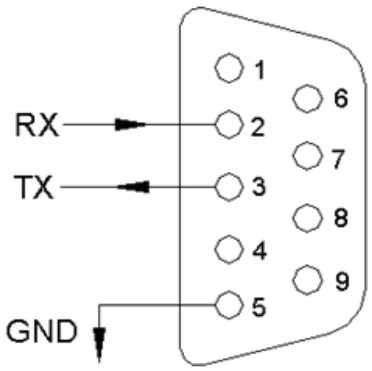

Figure 6: Pin usage on RS232-D9 socket

9. Technical Specifications

Table 5: Technical Specifications

G-NET MODEL	1K	1KS	2K	2KS	3K	3KS
INPUT						
Voltage (Vac)	160 – 300, single phase, ground connection required					
Maximum current (A)	7		12		16	
Frequency (Hz)	50, ±5 %					
Protection	Circuit breaker					
Power factor (PF)	As per EN60555-2					
OUTPUT						
Voltage (Vac)	220, ±3 %					
Frequency (Hz)	50, ±0.5 %					
Power factor (PF)	0.9					
Waveform	Sinusoid					
Power (kVA, kW)	1 kVA, 700 W		2 kVA, 1400 W		3 kVA, 2100 W	
Frequency deviation: - In battery mode or when input frequency deviates more than 5 %: - At normal input frequency:	±5 %					
	<±5 %					
Distortion: - At full load (linear)	<3 % THD					
- At full load (non-linear)	<6 % THD					
Inverter efficiency at 100% load (%)	92					
Overload tolerance	105 % : 60 sec.; 120 % : 5 sec.					
Overload protection	140 % : 200 msec; 150 % : 10 msec.					
Ratio max. / normal load	3:1					
Transfer times (msec.) - To battery - To bypass (characteristic) / (maximum)	0 2.5 / 4					
OPERATING ENVIRONMENT						
Temperature (°C)	0–40 (32–104 °F)					
Humidity (%)	20–90 (non-condensing)					
Altitude	<1500 m without derating					
Storage temperature (°C)	-15 to +40 (5–104 °F)					
Standards:	EN50081-1 / EN55022 Class B EN50082-1 / IEC801-2 Level 2 IEC801-3 Level 3 IEC801-4 Level 4 IEC801-5 Level 2					
BATTERIES						
Type	Sealed, lead-acid, maintenance free. 12 V 7 Ah per cell					
Voltage	36 V (3 cells)		96 V (8 cells)			
COMMUNICATION						
RS232	D9 socket connection					
DIMENSIONS						
H x W x D (cm)	22 x 14.5 x 40.5		33 x 19.5 x 45.5			
Weight (kg)	14.5	9	34	17	34	17